We Claim

1. An all-optical time division multiplexing system, comprising:
    a) first divider having first input and a first plurality of outputs for receiving input signals at said first input and directing said input signals to each of said outputs of said first plurality of outputs, said input signals arranged within periodic time slots;
    b) second divider having second input and a second plurality of outputs for receiving clock signals at said second input and directing said clock signals to each of said outputs of said second plurality of outputs, and
    c) a third plurality of AND gates each having third and fourth inputs and fifth output for receiving said input signals at said third input from one of the outputs of said first plurality of outputs and receiving said clock signals at said fourth input from one of the outputs of said second plurality of outputs, and
    d) said clock signals and said input signals coincide in said third and fourth inputs of the AND gates of said third plurality of AND gates in a consecutive order to produce at said fifth output images of said input signals such that only one AND gate of said third plurality of AND gates produces at said fifth output one image of one of said input signals at each time slots and in a consecutive cyclic order.
2. The system of claim 1 wherein said clock signals propagating in said second plurality of outputs are delayed relative to each other by integral number of said time slots.

3. The system of claim 1 wherein said clock signals are synchronized with said input signals.
4. The system of claim 1 wherein said third plurality of AND gates includes summing gates and threshold mechanism.
5. The system of claim 4 wherein said threshold mechanism selected from a group including optical thresholds and electronic thresholds.
6. The system of claim 1 wherein said consecutive cyclic order has a time period that is equal to integral number of said time slots.
7. The system of claim 6 wherein said integral number is equal to the number of AND gates included in said third plurality of AND gates.
8. The system of claim 1 wherein said clock signals are produced by an optical oscillator
9. The system of claim 1 wherein said system is constructed in a medium selected from a group of mediums including an open space, radiation guides, optical fibers, waveguides and planar waveguides.
10. The system of claim 1 wherein said input signals are interleaved signals received from several data channels.
11. The system of claim 10 wherein the image of each of said interleaved signals is produced at said fifth output of one of the AND gates of said third plurality of AND gates.